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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/981,807 | 10/19/2001 | Tetsuya Watanabe | 36595-176071 | 7561 |

26694 7590 06/15/2004

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WASHINGTON, DC 20043-9998

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| EXAMINER |
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PATEL, VISHAL A

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| ART UNIT | PAPER NUMBER |
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3676

DATE MAILED: 06/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/981,807

Applicant(s)

WATANABE ET AL.

Examiner

Vishal Patel

Art Unit

3676

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 4 and 6-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

This action is a non-final action

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1, line 1, "a shaft sealing apparatus", how can a shaft sealing apparatus have a vacuum casing and a drive shaft.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takebayashi et al (US. 6,676,132) in view of DeHart et al (US. 4,573,690).

Takebayashi discloses a combination of a vacuum casing (2) and a seal assembly (3) having the vacuum casing (casing 2, where B is under vacuum) formed with a vacuum chamber (where pressure in region B). A drive shaft (1) having an outer cylindrical surface and movably extending in the vacuum chamber of the vacuum casing. The seal assembly having a sealing ring in the form of an annular ring and including a

Art Unit: 3676

sealing lip (6a) held in contact with the outer cylindrical surface of the driving shaft and formed with an annular groove (groove where spring 8 lies). The sealing assembly having an annular spring member (8) received in the groove to impart a force (function of a spring) to the sealing lip to ensure that the sealing lip is held in tight contact with the cylindrical surface of the drive shaft.

The annular spring member of the sealing ring is made of metal wire in the form of a helical shape and is of a circular cross-section taken on the plane perpendicular to the center axis passing therethrough (garter spring 8 has this form).

Takebayashi discloses the invention substantially as claimed above but fails to disclose the outer cylindrical surface of the drive shaft is smaller in surface roughness Ra than 0.1 micrometer. DeHart discloses a shaft surface (pads 30 on shaft) that is in contact with a sealing lip and the shaft surface is smaller in roughness than Ra of 0.1 micrometer (column 4, line 63). It would have been obvious to one having ordinary skill in the art at the time the invention was made to configure the outer cylindrical surface to have a surface roughness that is smaller in surface roughness Ra than 0.1 micrometer as taught by DeHart, to provide an improved sealing surface (see abstract of DeHart) and to reduce seal friction (column 2, lines 5-8 of DeHart).

5. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takebayashi and DeHart as applied to claim 1 above, and further in view of Aihara (US. 5,853,502).

Takebayashi and DeHart disclose the invention substantially as claimed above but fail to disclose the outer cylindrical surface of the shaft to have hardness larger than Hv 650. Aihara teaches to have a shaft to have a cylindrical surface that has hardness larger

Art Unit: 3676

than Hv 650. It would have been obvious to one having ordinary skill in the art at the time the invention was made to configure the outer cylindrical surface of the shaft of Takebayashi and DeHart to have hardness larger than Hv 650, to provide better strength and excellent hardness as required by a particular environment (see Aihara).

6. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takebayashi and DeHart as applied to claim 1 above, and further in view of Reinsma (US. 4,331,339).

Takebayashi and DeHart disclose the invention substantially as claimed above but fail to disclose the sealing lip of the sealing ring is made of a synthetic resin constituted by an ultra high molecular weight compound. Reinsma teaches to have a seal made from synthetic resin constituted by an ultra high molecular weight compound (column 4, lines 1-10). It would have been obvious to one having ordinary skill in the art at the time the invention was made to configure the sealing lip of Takebayashi and DeHart to be formed of a synthetic resin constituted by an ultra high molecular weight compound as taught by Reinsma, to provide stronger lip seal (abstract of Reinsma).

Response to Arguments

7. Applicant's arguments with respect to claims 1-3 and 5 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vishal Patel whose telephone number is (703) 308-8495. The examiner can normally be reached on Monday through Friday from 7:30 PM to 4:00 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anthony Knight, can be reached on (703) 309-3179.

Art Unit: 3676

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-2168. Technology Center 3600 Customer Service is available at 703-308-1113. General Customer Service numbers are at 800-786-9199 or 703-308-9000. Fax Customer Service is available at 703-872-9325.

Any response to this action should be mailed to:

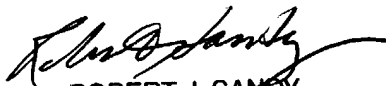
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or faxed to: 703-872-9326, for formal communications for entry before Final action:
or,
703-872-9327, for formal communications for entry after Final action.

Hand-delivered responses should be brought to Crystal Park Five, 2451 Crystal Drive, Arlington, Virginia, Seventh Floor (Receptionist suite adjacent to the elevator lobby).

VP
June 7, 2004

Judy J. Swann
Supervisory Patent Examiner
Tech. Center 3600


ROBERT J. SANDY
PRIMARY EXAMINER